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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

01/22/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/729,384	Applicant(s) IAN JOOS ET AL.	
	Examiner Gregg Cantelmo	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5,7-14 and 31-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,5 and 7-14 is/are allowed.
- 6) ☒ Claim(s) 31-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the amendment received November 5, 2007:
 - a. Claims 1, 5, 7-14 and 31-34 are pending;
 - b. The previous claim objections have been overcome in light of the amendment;
 - c. The prior art rejections of record have been overcome in light of the incorporation of allowable subject matter (indicated in the previous office action) into the independent claims as found in the claim amendment received on the date above;
 - d. New claims 31-34 are not allowable for reasons set forth in this office action. Presentation of new claims 31-34 permits finality of this office action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 33 and 34 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 33 recites "the body portion" in line 1 and "the edge portion" in line 2. Claim 33, is dependent upon claim 32 which has plural body portions and edge portions (one for each diffusion layer). Thus when claim 33 recites "the body portion" and "the edge portion" (singular) it is unclear which of the two body portions and edge portions

the claim is referring to. Presumably the limitations of claim 33 are applied to both diffusion layers and if so should be amended to reflect such else accurately define which body portion and edge portion the claim is directed to.

Claim 34 is dependent upon claim 33, does not remedy the deficiencies of claim 33 as reasoned above and hence is rejected for the same reasons.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

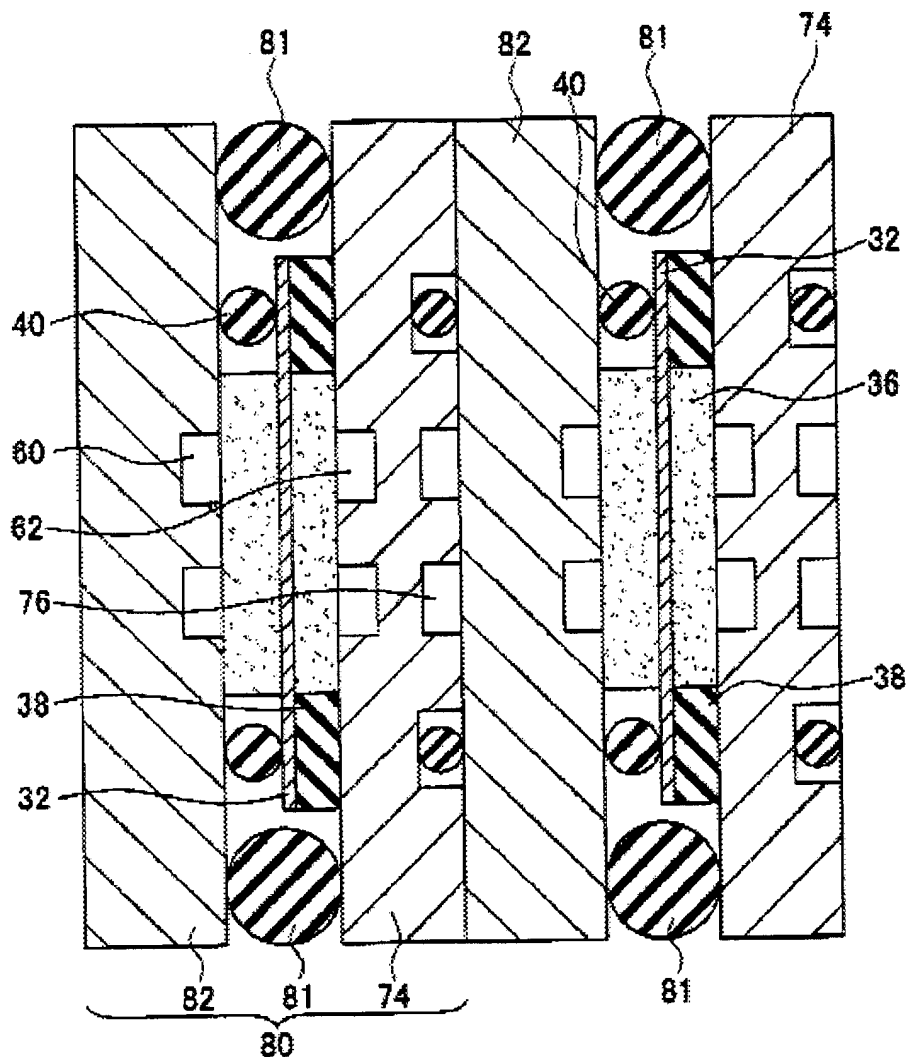
A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 7,201,987 (Sugita).

Sugita discloses: a membrane electrode assembly 32 disposed between a first reactant flow field plate 74 and a second reactant flow field plate 82 (Fig. 5); a first gas diffusion layer 36 disposed between the membrane electrode assembly 32 and the first reactant flow field plate 74 for diffusing reactant from the first reactant flow field to the membrane electrode assembly, the first gas diffusion layer 36 including a body portion and an edge portion (Fig. 5).

FIG. 5

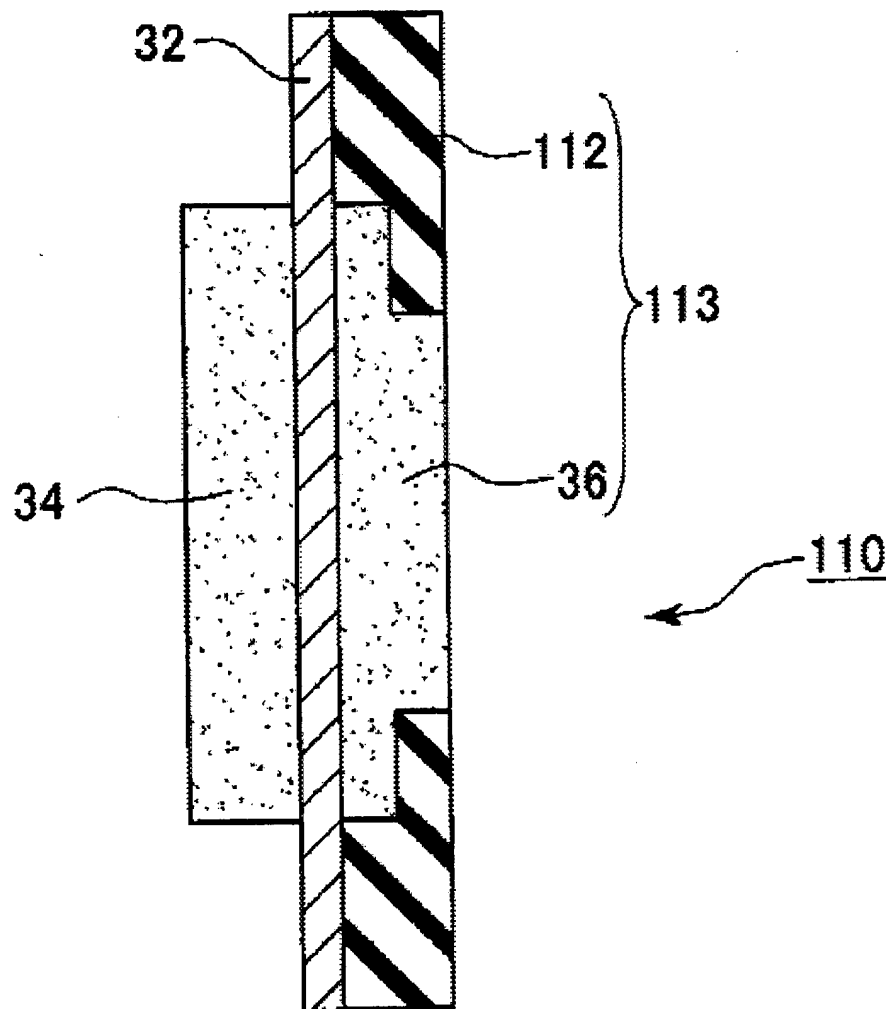


In one embodiment, Fig. 8, Sugita discloses the edge portion having reduced thickness providing a step between the body portion and the edge portion, the step provided on a first side of the first gas diffusion layer facing away from the membrane electrode assembly 32 (thus toward the flow field); and a first seal 12 disposed between

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the first reactant flow field plate and the membrane electrode assembly for impeding leakage of process fluids. The configuration below is such that the gas diffusion layer 36 provides a substantially flat surface immediately adjacent to the membrane electrode assembly 32 for supporting the assembly (as applied to claim 31).

FIG. 8



While only shown for one side, one of ordinary skill in the art would reasonably employ the same seal structure of Fig. 8 to both sides of the membrane electrode assembly and thus to the second gas diffusion layer as recited in claim 32. The

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structure and relationship of the second gas diffusion layer, second seal and membrane electrode assembly recited in claim 32 is identical to the structure and relationship recited to the first gas diffusion layer, first seal and membrane electrode assembly. Therefore the discussion above to the first diffusion layer, first seal and membrane electrode assembly of claim 31 is applied to the second diffusion layer, second seal and membrane electrode assembly as recited in claim 32.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita as applied to claims 31 and 32 above, and further in view of either U.S. Patent No. 6,057,054 (Barton) or U.S. Patent No. 7,087,339 (Wald).

The gas diffusion layers are inherently electrically conductive (as applied to claim 33).

The gas diffusion layers 36 are shown as a single unitary construction (Fig. 8 as applied to claim 34).

Sugita does not appear to teach or suggest that the perimeter portion sealed so as to prevent gases to diffuse in the perimeter portion (as applied to claim 33).

It is well known in the art to seal the ends of gas diffusion layers as shown by either Barton (Figs. 3A-3D) or Wald (Fig. 1).

The motivation for sealing the edge of the gas diffusion layer is to prevent reactant leakage from the diffusion and thus improves sealing of the diffusion layer.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Sugita by additionally sealing the edge portion of the gas diffusion layer as taught by either Barton or Wald since it would have provided the predictable result of improving the sealing of the gas diffusion layer.

5. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO '669, of record in view of U.S. Patent No. 7,201,987 (Sugita).

WO '669 discloses: a membrane electrode assembly 5/6/5 disposed between a first reactant flow field plate 10 and a second reactant flow field plate (not shown but inherently disposed adjacent to the lower electrode diffusion layer 1 (Fig. 10); a first gas diffusion layer 1 disposed between the membrane electrode assembly 5/6/5 and the first reactant flow field plate 10 for diffusing reactant from the first reactant flow field to the

membrane electrode assembly, the first gas diffusion layer 1 including a body portion and an edge portion (Fig. 10).

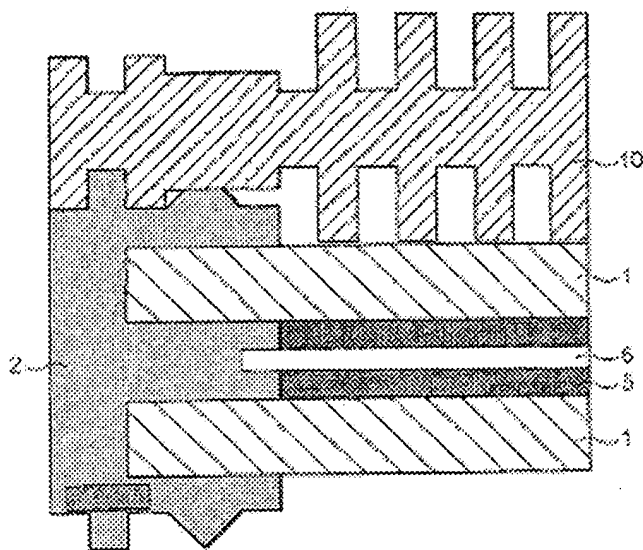


FIG. 10

In one embodiment, Fig. 3 of WO '669 discloses the edge portion having reduced thickness providing a step between the body portion and the edge portion, the step provided on a first side of the first gas diffusion layer facing the membrane electrode assembly; and a first seal disposed between the first reactant flow field plate and the membrane electrode assembly for impeding leakage of process fluids.

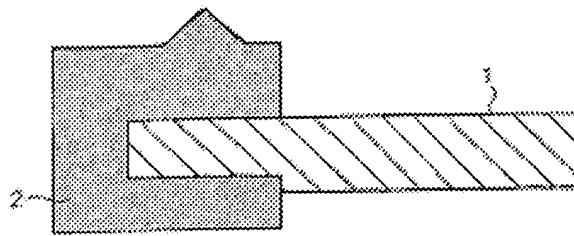


FIG. 3

The seal material 2 is a compressible material and upon compression of the stack it is reasonable to expect that the bottom portion of the seal 2 shown in Fig. 3 above will compress between the diffusion layer and membrane electrode assembly such that the seal abutting the edge portion of the first gas diffusion layer and having a height that corresponds to a height of the step of the first gas diffusion layer such that a second side of the first gas diffusion layer (lower surface in Fig. 3 as disposed in the arrangement shown in Fig. 1) facing the membrane electrode assembly provides a substantially flat first surface for supporting the membrane electrode assembly (as applied to claim 31).

While only shown for one side, one of ordinary skill in the art would reasonably employ the same seal structure of Fig. 3 to both sides of the membrane electrode assembly and thus to the second gas diffusion layer as recited in claim 32. The structure and relationship of the second gas diffusion layer, second seal and membrane electrode assembly recited in claim 32 is identical to the structure and relationship recited to the first gas diffusion layer, first seal and membrane electrode assembly. Therefore the discussion above to the first diffusion layer, first seal and membrane

electrode assembly of claim 31 is applied to the second diffusion layer, second seal and membrane electrode assembly as recited in claim 32.

The difference between claims 31-34 and WO '669 is that WO '669 does not teach of the steps facing the reactant flow fields.

In the case of WO '669 the step faces the membrane electrode assembly.

However providing the step facing either the membrane electrode assembly or the flow field is obvious in light of the apparent teachings of Sugita.

Therein Sugita teaches that a gas diffusion layer and peripheral seal can be configured with a gas diffusion layer 36 having a step that either faces the membrane electrode assembly 32 (Fig. 7 in the construct of the fuel cell shown in Fig. 5) or faces the flow field (Fig. 8 in the construct of the fuel cell shown in Fig. 5). Thus configuring the step of WO '669 would have been an obvious alternative configuration as taught by Sugita.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of WO '669 by providing the step of the gas diffusion layer so as to face the flow field as taught by Sugita since it would have provided an equivalent sealing configuration to a given reactant flow side of a fuel cell assembly.

6. Claims 33 and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over WO '669 in view of Sugita as applied to claims 31-32 above, and further in view of either Barton or Wald.

Each edge body portion of the diffusion layer 1 is electrically conductive (page 7, ll. 5-29 and paragraph bridging pages 8 and 9 as applied to claim 33).

The gas diffusion layers 1 are shown as a single unitary construction (as applied to claim 34).

Neither WO '669 nor Sugita appear to teach or suggest that the perimeter portion sealed so as to prevent gases to diffuse in the perimeter portion (as applied to claim 33).

It is well known in the art to seal the ends of gas diffusion layers as shown by either Barton (Figs. 3A-3D) or Wald (Fig. 1).

The motivation for sealing the edge of the gas diffusion layer is to prevent reactant leakage from the diffusion and thus improves sealing of the diffusion layer.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of WO '669 by additionally sealing the edge portion of the gas diffusion layer as taught by either Barton or Wald since it would have provided the predictable result of improving the sealing of the gas diffusion layer.

Response to Arguments

7. Applicant's arguments filed November 5, 2007 have been fully considered but they are not persuasive in light of the new grounds of rejection necessitated by amendment.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



gc

January 16, 2008

Gregg Cantelmo
Primary Examiner
Art Unit 1795